**Graph:** A graph is a pictorial representation of a set of objects where some pairs of objects are connected by links.

**A point** is a particular position in a one-dimensional, two-dimensional, or three-dimensional space.

**Loop:** if an edge is drawn from vertex to itself, it is called a loop.

**Pendent:** A vertex with degree one is called a pendent vertex.

**Isolate:** A vertex with degree zero is called an isolated vertex.

**Adjacent:** if there is an edge between the two vertices

**Parallel vertex:** if a pair of vertices is connected by more than one edge

**Eccentricity:** The maximum distance between a vertex to all other vertices is considered as the eccentricity of vertex.

**Diameter:** The maximum eccentricity from all the vertices is considered as the diameter of the Graph G.

**Circumference:** The number of edges in the longest cycle of graphis called circumference.

**Girth:** The number of edges in the shortest cycle of graph is called its Girth.

**Discrete Mathematics** is a branch of mathematics involving discrete elements that uses algebra and arithmetic.

**A set** is an unordered collection of different elements.

**Cardinality** of a set is the number of elements of the set.

**Relations** exists between objects of the same set or between objects of two or more sets.

**Equivalence Relation** if it is **reflexive**, **symmetric**, and **transitive**.

**Function** is a special relation between two sets

**One to One:** A function is said to be one to one if different elements is the domain have distinct images.

**onto** if the image of function is the entire codomain.

**Composition or Product function**: If output of one function is used to another function as input. Then this function is called composition function or product function.

**Proposition** is a collection of declarative statements that has either a truth value "true" or "false".

**Implication: p → q**

**literal** is a single logic variable or its complement

**minterm** is the product of all the literals with or without complement involved in a logic system.

**maxterm** is the sum of all the literals with or without complement involved in a logic system.

**Canonical expression**: A Boolean expression containing entirely of minterms or maxterms is known as canonical expression

**Incident**: When adjacent vertex has an edge of joining them; the vertices are then considered INCIDENT to the edge

**Trivial graph**: A graph with only one vertex is called a Trivial Graph.

**Walk:** A walk is a graph G is an alternating sequence of n+1 vetices.

**Path:** A walk in which all vertices are distinct is called a path.

**Closed Path:** The path said to be closed if *v0 = vn*.

**Simple Path:** A simple path is a path in which all vertices are distinct.

**Trial:** A trail is path in which all edges are distinct.

**null** **graphs** is a graph containing no edges

**Tree**: A graph T is called a tree if T is connected and T has no cycles.

**Spanning Tree**: A subgraph  of a connected graph  is called a spanning tree

**Homomorphic:** Two graphs G1 and G2 are said to be homomorphic, if each of these graphs can be obtained from the same graph

A **planar graph** is a graph whose lines are drawn in any plane

**Prim's algorithm** is a greedy algorithm that finds a minimum spanning tree for a connected weighted undirected graph.

**Minimal Spanning tree**: A spanning tree whose sum of weight (or length) of all its edges is less than all other possible spanning tree of graph G is known as a **minimal spanning tree** or **minimum cost spanning** tree.

**Simple Graph:** A graph with no loops and no parallel edges is called a simple graph.

**Connected Graph:** A graph is said to be connected if there exists a path between every pair of vertices.

**Regular Graph:** A graph G is said to be regular, if all its vertices have the same degree

**Complete Graph:** Ifa vertex should have edges with all other vertices, then it called a complete graph.

**Cycle Graph:** If the degree of each vertex in the graph is twoit’s called a Cycle Graph.

**Wheel Graph:** A wheel graph is obtained from a cycle graph by adding a new vertex. That new vertex is called a **Hub** which is connected to all the vertices of Cn.

**Complete Bipartite Graph:** if every vertex in V1 is connected to every vertex of V2.

**Star Graph**: A star graph is a complete bipartite graph if a single vertex belongs to one set and all the remaining vertices belong to the other set.

**Complement Graph**: If the edges that exist in graph I are absent in another graph II, and if both graph I and graph II are combined together to form a complete graph, then graph I and graph II are called complements of each other.

**Planer Graph:** A graph is said to be planar if it can be drawn in a plane so that no edge cross.

**Region of a Graph:** It is an area of the plane that is bounded by edges and cannot be further subdivided.

**Proper Coloring:** A coloring is proper if any two adjacent vertices have different colors otherwise it is called **improper** coloring.

**Chromatic number of G:** The minimum number of colors needed to produce a proper coloring of a graph G is called the chromatic number.

**Handshaking Theorem:** The sum of degrees of all the vertices in a graph is equal to twice the number of edges in the graph.

**Euler Path:** A Euler Path through a graph is a path whose edge list contains each edge of the graph exactly once.

**Euler Circuit:** If the initial vertex appears a second time as the terminal vertex.